January 1928 Botanical Series Vol. XV, No. 5

Memoirs of the Department of Agriculture in India

Asterina spp. from India

BY

DR. RUTH RYAN

Rosary College, River Forest, Illinois, U.S.A.

AND

Meliola spp. from India and one from Malay

BY

PROFESSOR F. L. STEVENS

Urbana, Illinois, U.S.A.

AGRICULTURAL RESEARCH INSTITUTE, PUSA

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ASTERINA SPP. FROM INDIA.

DETERMINED BY

DR. RUTH RYAN,

Rosary College, River Forest, Illinois, U. S. A.

(Received for publication on 9th June 1927.)

Asterina holarrhenæ, n. sp.

The fungus occurs on the upper surface of the leaves in distinct patches, 2-3 mm. in diameter. Perithecia numerous, round, radiate, carbonaceous; margin fimbriate and light brown, ostiolate, 115-214 μ in diameter. Mycelium grey-brown, straight, 4 μ thick. Hyphopodia sessile, alternate, 3-lobed, 4×10 μ, one-celled. Asci spherical, 34-44 μ in diameter. Spores 2-celled, 12×26-30 μ, brown, the free end of each cell rounded, smooth. The fungus is near *Asterina sphaerotheca*, but differs from it in the size and shape of the perithecia and asci.

On *Holarrhena antidysenterica* Wall. Syndai, Khasi and Jaintia Hills, Assam, Jan. 1915. Leg. L. S. Subramaniam. Herb. Crypt. Ind. Orient. No. 1963.

Asterinella Winteriana (Pezschke) Th.

Fungus epiphyllous. It agrees with the description for *A. Winteriana* Th. *Syll. Fung.* XI, 1255.

Scattered on the lower surface of the leaf are numerous small black spots of another *Asterina*. When examined, the fungus proved to be immature. The general structure of the perithecia and absence of external mycelium shows relationship to Microthyrium and Seynesia. The perithecial covering is striking. It is light straw color with irregularly scattered dark brown sharp pointed cells.

On *Castanopsis* sp. Pachanadi, Mangalore. Apr. 16, 1913. Leg. L. S. Subramaniam. Herb. Crypt. Ind. Orient. No. 1965.

Asterina cansjeræ, n. sp.

The fungus occurs on both surfaces of the leaves in small spots, 2-3 mm. in diameter. Perithecia numerous, carbonaceous, margin distinctly radiate and fimbriate, ostiolate, opening by radiating fissures, 160-200×120-144 μ. Mycelium light brown, straight, 4 μ thick. Hyphopodia alternate, of two kinds—short sessile, lobed, 4×4 μ, and cylindrical 10×6 μ. Numerous brown conidia, pear shaped, 12×22 μ. Asci ovate, 28-32 ×36-44 μ. Spores dark brown, 2-celled, margin rough 8×18-22 μ.

On *Canajera Rheedii* Gmel. Dharwar, Bombay, Oct. 1918. Leg. L. J. Sedgwick. Herb. Crypt. Ind. Orient. No. 1966.

Asterina nothopegiæ, n. sp.

Fungus occurs on both sides of the leaves. Perithecia are clustered, round, black, ostiolate, margin fimbriate, 132-181 μ in diameter. Mycelium chocolate brown, 10 μ, thick. Hyphopodia alternate 2-celled, cylindrical to slightly lobed, 12×28-32 μ. Asci globose to oval, 20-33×25-42 μ. Spores dark brown, 2-celled 8-10×20-28 μ.

On *Nothopegia Colebrookiana* Bl. Talguppi, Mysore, Oct. 29, 1911. Leg. G. S. Kulkarni. Herb. Crypt. Ind. Orient. No. 1970.

Asterina memecyloniæ, n. sp.

Fungus forms dark spots 3=4 mm. in diameter on the leaves. Perithecia round, 132 μ in diameter. Mycelium brown, 6 μ thick. Hyphopodia sessile, knob shaped, 8×12 μ. Asci ovate, 36×64 μ. Spores 2-celled, dark brown, 14×36 μ.

On *Memecylon edule*. Karwar, Bombay, Oct. 1919. Leg. L. J. Sedgwick. Herb. Crypt. Ind. Orient. No. 1972.

There is also another Microthyriaceous fungus, but no asci or spores could be found, so no determination could be made.

Asterina pluriporus, n. sp.

Fungus forms large irregular black spots on the lower surface of the leaves, 2-10 mm. in diameter. Perithecia round, carbonaceous, numerous ostioles, margin light brown, radiate, fimbriate, 264-848 μ in diameter, Mycelium light brown, wavy, 6 μ thick.

Hyphopodia crook-shaped, one-celled 12-14×24-36 μ. Asci ovate to globose, 80-84×84-104 μ. Spores brown, 2-celled, 24-×40-42 μ.

On *Shorea Talura* Roxb. Siddapur, N. Kanara, Oct. 1919. Leg. L. J. Sedgwick. Herb. Crypt. Ind. Orient. No. 1975.

Morenoella shoreae, n. sp.

On the upper surface of the leaves forming small irregular spots. Perithecia linear, carbonaceous, with a longitudinal fissure, 330-346×247-544 μ. Margin irregular, fimbriate and distinctly radiate, light brown. Mycelium brown, nodulate, 6 μ thick, straight. Asci oval to globose, aparaphysate, 40×48-52 μ. Spores brown 2-celled, 4 spores to an ascus, 20×36-40 μ.

On *Shorea Talura*. Siddapur, N. Kanara, Oct. 1919. Leg. L. J. Sedgwick. Herb. Crypt. Ind. Orient. No. 1975.

Asterinella intensa (Che. and Mass.) Th.

Broteria, 10 : 101-123, 1912.

Fungus is very like *Asterinella intensa* as described, except that the perithecia are slightly smaller. Asci and spores correspond to the measurements given.

On *Elaeodendron glaucum* Pers. Madras. Herb. Crypt. Ind. Orient. No. 1976.

MELIOLA SPP. FROM INDIA AND ONE FROM MALAY.

DETERMINED BY

PROFESSOR F. L. STEVENS,

Urbana, Illinois, U. S. A.

(Received for publication on 9th June 1927.)

Meliola theacearum, n. sp.

Colonies amphigenous, mainly epiphyllous, 1-3 mm. in diameter or coalescing to cover the leaf, dense to crustose in old regions, loose at edge of colony. Mycelium nearly straight, black, 7-11 μ thick. Spot none. Capitate hyphopodia alternate, about 18 μ apart. Stalk cell short, 3-4 μ; head cell oblong, 14×10 μ. Mucronate hyphopodia ampulliform, abundant. Perithecial setae none. Mycelial setae very few, simple, obtuse or short toothed, 390-800 μ long. Perithecia globose, rough, on radiate disks, small, 125 μ. Asci 2-4 spored, evanescent. Spores 4-septate, 42-46×18-22 μ, middle cell larger.

Group number 311-31. 4323. Herb. Crypt. Ind. Orient. No. 1982. On Theaceae, *Schima*.

Malay : Penang, Govt. Hill, July 1918. Leg. E. J. Butler. Plate I, figures 1 to 4.

This is of special interest as the only true *Meliola* recorded upon any member of the Theaceæ. In a general key, it would fall near *M. litseae* from which it is separated by the nature of the setal branches.

Meliola eugeniicola, n. sp.

Colonies amphigenous, thin, circular, 1-5 mm. in diameter. Mycelium straight, thick, 7 μ, dark, branching often nearly at right angles. Spot none. Capitate hyphopodia opposite, antrorse, close, 18 μ. Stalk cell short, 3-4 μ; head cell cylindrical or slightly irregular, 14-15×7-8 μ. Mucronate hyphopodia ampulliform. Perithecial setae none. Mycelial setae long, 460-1100 μ, simple, acute, straight or gracefully flexuose. Perithecia dimidiate when young, globose when mature, smooth, 140 μ in diameter, from alveolar disks. Asci evanescent. Spores 4-septate, 43×18 μ.

Group number 3112×4224. Herb. Crypt. Ind. Orient No. 1989. On Myrtaceæ. *Eugenia eucalyptoides* F. Muell.

India : Pachanadi, Mangalore, April 16, 1913. Leg. L. S. Subramaniam.

Plate II, figures 9 to 11.

Though some twenty-five species of the Meliolinæ have been described on the Myrtaceæ, this shows superficial resemblance with only two, *viz.*, *M. amomicola* from which it differs markedly in colony and mycelial characters and in the fact

that the hyphopodia are strictly opposite; and *M. horrida Rehm* (not Ell. & Ev.) from which it differs in its setae and colony.

In a general key, it would fall with these *Meliolas* of formula 3112 with acute setae. From all of these it differs in length of setae.

Meliola holigarnae, n. sp.

Colonies hypophyllous, sub-circular, 1-3 cm. in diameter, sooty black, velvety. Mycelium thin, pale non-adherent. Spot none. Capitate hyphopodia alternate, not abundant, very irregular and irregularly spaced. Stalk cell short, 11 to 22-30 μ long; head cell very irregular, ovate, clavate or lobed, 25×14 μ. Mucronate hyphopodia ampulliform, few. Perithecial setae none. Mycelial setae simple, obtuse, dark, very numerous, crooked, 540-620 μ. Perithecia globose, rough, 114-266 μ. Asci mostly 2-spored, ovate, 50-88×22-44 μ. Spores elliptical, 4-septate, middle cell much larger than the others, 60-69×24-30 μ.

Group number 3111—6333. Herb Crypt. Ind. Orient No. 1981 and 1986*a*.

On Anacardiaceæ, *Holigarna Grahamii*.

India: Anmod, N. Kanara, Dec. 25, 1917, No. 1981. Leg. L. J. Sedgwick. Ekambi, N. Karnara, Oct. 1919, No. 1986*a*. Leg. L. J. Sedgwick. Plate I, figures 5 to 8.

No species resembling this has been noted on the Anacardiaceæ or indeed on any other host. The abundant non-adhering mycelium with very irregularly spaced hyphopodia which are also irregular in shape as well as spores of great size and characteristic shape are distinctive. The aspect of the fungus throughout is rather that of a *Meliolina* than of a *Meliola* and the scarcity of hyphopodia emphasizes this relationship. It constitutes a very interesting transition form between these genera.

Meliola pterospermi, n. sp.

Colonies epiphyllous, black, circular, 1-3 mm. in diameter, often confluent and largely covering the leaf. Mycelium dark, crooked, closely tangled, but hardly crustose, 7-8 μ thick. Capitate hyphopodia alternate, numerous. Stalk cell short, 3-4 μ; head cell clavate, usually irregular to lobed, sometimes crenate, 18×14 μ. Mucronate hyphopodia ampulliform. Perithecial setae none. Mycelial setae simple, 200-425 μ, obtuse, dark, lighter at tip, often curved, septate. Perithecia globose, rough, 175-250 μ in diameter, arising from radiate disks. Asci 2-4-spored, evanescent, 50-80×17-35 μ. Spores 4-septate, 35-50×15-22 μ, middle cells generally swollen.

Group number 3111. 4332. Herb. Crypt. Ind. Orient. No. 1987.

On Sterculiaceæ, *Pterospermum* sp.

India: Bassein, Burma, Nov. 30, 1912. Leg. E. J. Butler.

Plate II, figures 12 to 14 and Plate III.

No true *Meliola* has heretofore been reported upon any of the Sterculiaceæ. In general classification this species is near *M. tamarindi.*

Meliola indica, Sydow var, *caryae,* n. var.

On Lecythidaceæ, *Careya arborea* Roxb.
India : Gairsoppa Falls, N. Kanara, Oct. 1919. Herb. Crypt. Ind. Orient. No. 1985. Leg. L. J. Sedgwick.
This differs from the Philippine type in its longer setae (to 650 μ) and its slightly elongate hyphopodia and crooked mycelium.

Meliola elmeri Sydow. *Leaf. Phil. Bot.* 5 : 1537, 1912.

On Pittosporiaceæ, *Pittosporum dasycaulon* Miq.
India : Ghat Forests, N. Kanara, Oct. 1919. Leg. L. J. Sedgwick.
Herb. Crypt. Ind. Orient. No. 1983.

Meliola sakawensis. Hennings, Hedw 43 ; 141. 1904.

On Verbenaceæ, *Vitex leucoxylon* Linn.
India : N. Kanara, Bombay, Oct. 1919. Leg. L. J. Sedgwick.
Herb. Crypt. Ind. Orient. No. 1984.

Meliola crescentiae Stevens. in lit.

On Bignoniaceae, *Heterophragma* Roxburghii. D. C.
India : Dharwar, Bombay, Dec. 1918. Leg. L. J. Sedgwick.
Herb. Crypt. Ind. Orient. No. 1993.

Meliola simillime E. and E. Ann. Rept., Mo. Bot. Gard. 9 : 118. 1898.

Syn. Meliola *wrightiae* Yates, *Phil. Jour. Sc.* 13 : 371. 1918.
On Apocynaceæ, *Holarrhena antidysenterica* Wall.
India : Dacca, March 12, 1913. Leg. A. L. Som.
Herb. Crypt. Ind. Orient. No. 1988.

Meliola arundinis, Pat. *Jour. d. Bot.* 11 : 348, 1897.

On Gramineae, *Phragmites Karka* Trin.
India : Ballabari, Kamrup, Assam, Feb. 27, 1912. Leg. M. Taslim.
Herb. Crypt. Ind. Orient. No. 1991.
Herb. Crypt. Ind. Orient. No. 1990. Puttimari, Feb. 25, 1912. Leg. M. Taslim.
These specimens are of somewhat unusual interest in that the setae are sometimes simple.

Meliolineae ind.

The following specimens are worthy of record as showing geographic and host distribution though the species cannot be determined either owing to suppression of characters by parasites or to scantiness of material.

Herb. Crypt. Ind. Orient No. 1992.

On Pandanaceæ, *Pandanus*.

India : Salebile, Mysore, 10th Sept. 1903. Leg. E. J. Butler.

Spores 4-septate, hyphopodia alternate. All colonies very heavily parasitized. It is especially desirable that determinable specimens be collected since no one of the Meliolineæ has been reported on this host family.

Herb. Crypt. Ind. Orient. No. 1986*b*.

On Myrtaceæ, *Eugenia latifolia*.

India ; Pachanadi, Mangalore, Apr. 16, 1913. Leg. L. S. Subramaniam.

Spores 4-septate, 40-46 × 15-18 μ, hypopodia alternate.

Herb. Crypt. Ind. Orient. No. 1995*a*.

On Rutaceæ, *Citrus* sp.

India : Calicut, Malabar, Sept. 29, 1904. Leg. E. J. Butler.

Very heavily parasitized.

Herb. Crypt. Ind. Orient. No. 1995*b*.

On Rutaceæ, *Citrus acida*. Roxb.

India : Wahjain, Assam, May 17, 1905. Leg. Inayat Khan.

Very heavily parasitized.

It is of interest to note that these heavily parasitized specimens from India bear identically the same species of parasites, chiefly of the genera *Speggazzinia*, *Helminthosporium*, and *Arthrobotrium* that are found in Africa, Hawaii and the Americas.

Herb. Crypt. Ind. Orient. No. 1994.

On Rubiaceæ, *Ixora parviflora*.

India : Bilikeri, Mysore, Sept. 1920, 1903. Leg. Inayat Khan.

This is possibly either *Irene uncaria* or *I. cryptocarpa*, but it is too heavily parasitized to determine certainly.

Specimens of *Asterina* and of *Meliola* from the herbarium of the Agricultural Research Institute, Pusa, were sent to the Imperial Bureau of Mycology, London, for the purpose of having them named. The material from which the specimens were named is deposited in the herbarium of the Imperial Bureau of Mycology, London, while the bulk material is in the herbarium of the Agricultural Research Institute, Pusa.

W. McRae,
Imperial Mycologist.

EXPLANATION OF PLATES.

PLATE I.

Meliola theacearum, n. sp.

FIG. 1. Mycelium showing habit.
FIG. 2. Mycelium showing mucronate hyphopodia.
FIG. 3. Mycelium showing capitate hyphopodia.
FIG. 4. Setae showing tips.

Meliola holigarnae, n. sp.

FIG. 5. Mycelium showing habit with a perithecium.
FIG. 6. Mycelium showing mucronate hyphopodia.
FIG. 7. Mycelium showing capitate hyphopodia.
FIG. 8. Spores.

PLATE II.

Meliola eugeniicola, n. sp.

FIG. 9. Mycelium showing habit.
FIG. 10. Mycelium showing mucronate hyphopodia.
FIG. 11. Mycelium showing capitate hyphopodia.

Meliola pterospermi, n. sp.

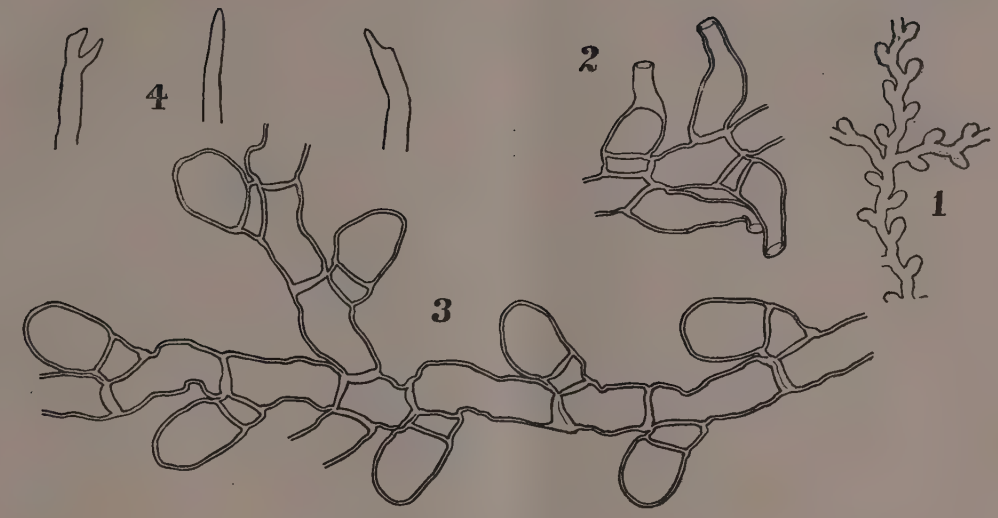
FIG. 12. Mycelium showing habit.
FIG. 13. Mycelium showing mucronate hyphopodia.
FIG. 14. Mycelium showing capitate hyphopodia.

PLATE III.

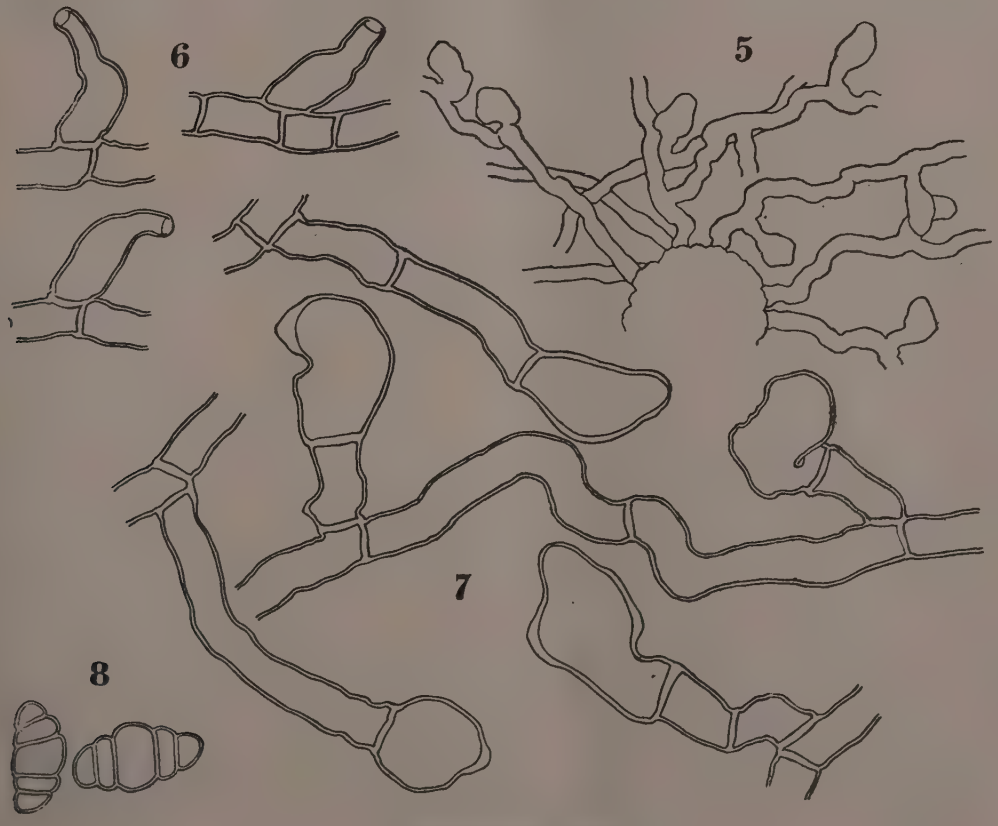
Meliola pterospermi, n. sp.

Photograph showing general habit.

MGIPC—M—IV-2-50—10-2-28—650.



Meliola theacearum Stevens.



Meliola holigarnae Stevens.

Meliola eugeniicola Stevens.

Meliola pterospermi Stevens.

PLATE III.

Meliola pterospermi Stevens.

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